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BONE TUNNELING AND DRAINAGE

IN THE
EARLY STAGES OF TUBERCULAR COXITIS.

BY

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ANY operative treatment that has for its object the prevention of the more serious sequelæ of tubercular arthritis, particularly when affecting larger joints, and promoting thereby the chances of cure, must, when carrying with it satisfying credentials, be deemed of surgical interest. From experience acquired in two surgical hospitals during the last twenty years, I have come to the conclusion that bone tunneling and drainage, combined with fixation and rest, is one which in suitable cases, should commend itself to surgeons. The treatment is largely based on Kirkpatrick's method of boring and cauterisation, one which, in my opinion, has not received the attention at the hands of surgeons which it merits.

Since the date of my first communication on this subject (1886), the results of the treatment I will presently describe, in several cases of the early stages of tubercular arthritis of the hip in which I employed tunneling and drainage, have strengthened the conviction in my mind as to its surgical value in properly selected cases.

Although I have employed it in tuberculous disease of various

joints—viz., of the ankle, knee, wrist and elbow as well as the hip, it is to the cases in which the latter joint is engaged that I should wish chiefly to direct attention, not only on account of the hip being so favourite a habitat for tuberculous disease, but also because surgical opinion is still so unsettled in reference to the treatment, curative or preventive, that should be adopted to avert the consequences which in this disease are of so exceptionally serious a character.

The mode of treatment has been and probably will be criticised on the ground that in a case of tubercular coxitis, tunneling, antiseptic irrigation and drainage, could not, except in the parts immediately bordering on the tunnel, reach and beneficially influence other portions of the tissue which are more or less infected with tuberculous bacilli, and in a condition of hyperplastic infiltration and softening. It is, no doubt, difficult to offer a satisfactory explanation as to how the tunnel beneficially affects portions of the bone through which it does not pass. But a similar objection might be brought against the treatment of tubercular peritonitis by abdominal section and irrigation, or of tubercular synovitis by arthrectomy, in neither of which cases can we hope to reach and remove all the infective agencies, and yet no surgeon of experience can doubt that the modes of treatment alluded to are attended, as a rule, with beneficial results.

I shall not detain you by recounting the clinical records of all the various cases of tubercular joint disease I have treated in this manner, but mention the particulars of one

I operated on recently, which I consider a typical example of the condition which I think so likely to be benefited by this treatment:—

A young man, I. O'H., aged twenty, was admitted into hospital on February 25, 1893.

He was by occupation a carpenter, and eleven months previously to his admission first suffered from “stings of pain,” which he referred to the front and inner side of the upper part of the thigh on the right side. He then found that in walking, leaning his weight on the affected side was attended with difficulty and pain, and necessitated the use, first of one and soon after of two sticks. Shortly after this he consulted Dr. Macaulay, of Ballina, who recognised the disease as *morbus coxæ*, admitted him into the Infirmary, and adopted appropriate local and constitutional treatment for upwards of two months.

The patient then returned home, but seven months subsequently, the progress of the case not being satisfactory, he came up to town and placed himself under my care. On his admission into hospital the patient's suffering was extreme.

The slightest movement gave him acute pain. The affected limb was apparently lengthened, the leg abducted, and foot everted. There was great muscular wasting, obliteration of the inguinal fold, and in its place some prominence, due to enlarged lymphatic glands; a fulness or prominence of the great trochanter, which was exquisitely painful on pressure, the pain being felt for some distance below this; there was also obliteration of the gluteal fold, and well-marked lordosis.

As a youth the patient enjoyed good health, never suffered from any illness except the usual infantile ailments, until two years ago, when a large abscess formed on the front of the

thigh, which he attributed to a severe strain he sustained while carrying a heavy load. The abscess was opened, and ultimately got quite well.

The condition of the patient on his admission was in every sense a pitiable one. The pain, which was extreme, was chiefly localised in and about the great trochanter; even the vibration caused by walking across the ward induced pain.

Attempts to make any careful examination of the joint were, without the aid of anæsthetics, impossible. The result of my examinations of the patient was that I deemed the case to be one of *femoral coxitis*, probably originating from tubercular trochanteric periostitis.

On May 3rd I operated. The procedure consisted in making a free incision on the centre of the great trochanter, dividing and detaching the periosteum, which was found much thickened on each side of the incision, then applying the point of a $\frac{1}{2}$ inch gimlet augur, and kept at right angles to the axis of the shaft of the bone. After a few rotations of the instrument, the compact tissue of the bone was perforated. The completion of the tunnel was effected by a similar but smaller sized instrument, so that the diameter of the entrance of the tunnel should exceed that of the channel by about $\frac{1}{8}$ th of an inch. The drainage from the bone is rendered more efficient by having the bone tunnel somewhat bell-shaped.

When the second gimlet augur was removed, it was followed by the escape of about two drachms of purulent matter. This was quite unexpected, and, I think, adds greatly to the interest of the case.

The abscess cavity was carefully erased with a small Volkmann's scoop, then thoroughly irrigated with a warm boric solution. A few strands of chromicised catgut were then inserted into the tunnel, and kept *in situ* by boric wool dressing.

In reference to the daily progress of the case, I need not

say more than to state that the wound remained perfectly aseptic. The drainage was continued for ten days, and the wound then healed perfectly. The operation was attended with almost immediate relief from pain, and in three weeks from the date of the operation the patient was able to be up and walk about the ward without inconvenience.

Since the patient returned home, the tidings received of his progress have been satisfactory.

This case, therefore, is one of several others of tubercular disease of bone in the immediate vicinity of joints, which I have treated by bone tunneling and drainage. The advantages of the treatment are more conspicuous in the cases of tubercular disease in or near the hip-joint than in any other articulation; but for the success of the operation it is essential that it should be undertaken in the early stages of the disease, and before any structural change has occurred in the joint. It is also essential that the form of the disease be the one which commences as a femoral osteitis, either central or peripheral, which is, in my opinion, by far the most usual one we have to deal with.

It is disheartening to note from either the discussion of any of our surgical societies or congresses, or from the writings in our text-books, how far we are from any finality in determining the best line of treatment that should be adopted in cases of tubercular disease of the hip.

The methods of "methodical expectancy," arthrectomy, resection, and rigid fixation, the possibility of which I entertain very strong doubts of, have all had as warm

advocates as bitter opponents. This diversity of opinion is doubtless due to a twofold cause; one is the variation in the degrees of development the disease has reached when first seen by the surgeon, and the other is, there not being a sufficient appreciation made of the cases in which operative measures of a preventive character can be undertaken with a fair prospect of success, and those in which more radical treatment is called for.

For practical purposes we may, I think, classify cases of this disease into two groups: first, those that have reached the destructive stages of intra-articular suppuration and necrosis of cartilage and bone, and, secondly, those in the pre-destructive stage, where, namely, the lesion is limited, as I believe it to be in the majority of instances, to an epiphysary or to a central osteitis.

The treatment of the former group I do not propose now to discuss, except in so far as stating that I cannot endorse the favourable opinions of some operating surgeons as to the merits of resection of the hip; but with the latter I entertain strongly the opinion that if recognised—and, as a rule, no small diagnostic skill is required to do so—and promptly treated by the method of tunneling and drainage, the necessity for any of the more serious operative measures, such as arthroctomy, resection, and amputation, practised in the treatment of this disease may, in many cases, be obviated.

As regards the early pathological changes in tubercular arthritis of the hip, little has been added since the publication

of Sir B. Brodie's work on *Diseases of the Joints*, and surgeons are still disposed to accept his opinion that the disease in the great majority of cases is primarily in the cancellated tissue of the bones, consisting of a preternaturally vascular condition "with a less than usual proportion of the phosphate of lime in its composition, there being at the same time a deposit of fluid, apparently serum, in the cancelli."

Mr. Barwell expresses himself strongly to the effect that in "nearly all" cases of chronic tubercular hip-joint disease, the primary lesion is in the bone, and more especially about the epiphysary junctions. Mr. Greig Smith has, in my opinion, more accurately and exhaustively than any previous writer defined the condition of things we have to deal with. He has classified these chronic tubercular or strumous inflammations of joints into those which commence as an inflammation of the synovial membrane, and those which consist of an inflammation of the pink marrow in the cancellated ends of the long bones. These he terms respectively "*synovio-arthritis* and "*medullo-arthritis*."

This appears to me to be the best division to make of the forms of strumous arthritis.

The importance of differentiating them is undoubtedly great, although I am aware that authorities such as Mr. Cooper Foster and Mr. Edmund Owen regard the question of what structures are involved primarily as of little practical value. The practical importance, however, of differentiating the synovial from the medullary form of arthritis, as well as

in addition recognising whether the latter is in or has passed the predestructive stage is obvious, as on these considerations depend entirely the success or failure of the system of bone tunneling. The practical importance, therefore, of differentiating cases of synovio- from medullo-arthritis is obvious. To do this in many cases requires exceptional diagnostic skill, especially in dealing with the knee and ankle joints in which articulations—and the remark applies also to the elbow, owing doubtless to the synovial structures being so superficially situated and comparatively devoid of the protecting structures that they have in the coxo-femoral and scapulo-humeral joints—are much more liable to be primarily affected.

Assuming, therefore, that the medullo-arthritic view is correct, and I for one have no doubt about it, we have in the early stages of tubercular hip disease the following condition of things to deal with. The upper part of the bone, more particularly the great trochanter, neck and head of the bone, is in a condition of chronic tuberculous inflammation, and the products of this condition, ever ready to caseate or suppurate, “cribbed, cabined, and confined” within its bony shell and fibrous envelope, have always the tendency to escape where the resistance is weakest. This is when it is covered by cartilage. It is unnecessary for me to dwell on the urgent necessity there is for taking steps to prevent the disaster of intra-articular suppuration, a condition attended, as a rule, by such calamitous results, and one not

too forcibly designated by Hueter as a "nearly absolutely fatal process." In dealing with such cases the consideration of paramount importance is to determine what measures should be adopted to prevent or thwart the baneful influences that are at work, slowly it may be, but surely, to reach the fatal goal of intra-articular suppuration.

Does a system of "methodical expectation," no matter how formally and systematically carried out, tend, in the majority of cases, to retard or prevent it? The generally received opinion is that it does, but the view I feel compelled to sustain is distinctly the reverse of this. Mr. Greig Smith has well observed if there be justification for the treatment of strumous glands in the neck by removal, there is much stronger justification for the removal of a similar diseased structure inside bone. Inside a bony shell, everything is against spontaneous cure. Compressed, and perhaps strangulated, by the outer shell, the inflammatory products are driven to destruction, and when decay has set in, the abundant bony trabeculæ entangle the degenerate products, and delay their discharge through any opening that may have formed. The very chronicity of the course begets thoroughness of destruction.

If these views be correct, and there is little reason to suppose that they are not, it would follow that any system of expectant treatment, no matter how methodically and carefully carried out is unlikely to be attended with beneficial results. I am far from denying that cases of tuberculous *morbus coracæ*

do not occasionally recover under an expectant *régime*, if I might so term it. But these are the exception, not the rule, and depend for their recovery more on remedial agencies of a constitutional nature, than on any plan of fixation and rest that may be adopted. The indiscriminate employment of a system of long-continued methodical inactivity of the limb, however useful it may be locally in some cases, is more than counter-balanced by the mischief it does to the system generally in the event of any of the more serious operations, such as resection or amputation, having eventually to be performed, undoubtedly leaves the patient in a worse condition as regards the prospects of ultimate recovery. If a proof were wanting of the inadequacy of rest as a treatment for tubercular arthritis, it is the fact of the frequency with which we have to perform resections and amputations in dealing with the more advanced stages of this disease.

In England the treatment of bone tunneling and drainage has been amply tested by Mr. Greig Smith, Mr. Edmund Owen, and also by Mr. Noble Smith. The former has, as I have already pointed out, with his accustomed ability warmly advocated the practice, and Mr. Noble Smith (*The Lancet*, February 6, 1889) states that "as far as my experience is concerned, drilling has produced an almost immediate and permanent benefit, and I am encouraged to believe that in conjunction with absolute fixation of the joint (no easy matter) it is an operation which should be performed without delay in every case where after the result of fixation is

determined the joint is painful upon gentle pressure. If the parts are also hot to the hand and visibly swollen the need is greater, and the good results will be more marked.”

In Ireland the treatment of bone tunneling and drainage has had the advantage of the advocacy of Sir Thornley Stoker and Mr. M'Ardle, both of whom have contributed papers of surgical importance on this subject. The latter surgeon has operated on 21 cases of coxo-femoral arthritis, in seven of which there was perfect restoration of joint functions.

In reference to the points I have discussed in this communication, the conclusions I have arrived at are :—

1. That in the great majority of instances tubercular disease of the hip-joint commences as a central osteitis of the upper end of the shaft of the femur.

2. That it is of the greatest importance to recognise this stage of the disease.

3. That to check the progress of the disease, a system of methodical expectation is not only insufficient, but may be attended with serious consequences to the patient.

4. That the results of resection of the hip-joint are the reverse of encouraging.

5. That to diminish the chances of supervention of secondary inflammation of the soft tissues of the joint suppuration and ultimate destruction of the joint, a system of bone tunneling and drainage gives a good prospect of success in the treatment of this disease.

Recently a case of coxitis originating in trochanteric osteitis was under my observation and treatment in the Meath Hospital. Mr. Lyle, the Resident Surgeon, has furnished the following brief note of the case:—

M. A. R., aged twenty-two, by occupation a housewife, was admitted into the Meath Hospital, under Sir William Stokes' care, on the 19th September, 1895. She stated that about four months previous to her admission she got a fall on her right side, which compelled her to keep very quiet for some days, as any motion intensified the pain, which she referred chiefly to the right trochanter. After a short time there was much improvement in her symptoms, and she was able to be up, but this was only temporary, and she had again to take to her bed in consequence of the severe pain she suffered from in the hip-joint, and which she stated was always greatly aggravated at night. She described it as being sometimes agonising. On examination it was found that the patient was unable to move her right leg without great pain, which she referred to the hip and great trochanter. The gluteal fold was lost, and the muscles of the buttock were already much wasted.

It seemed tolerably plain to Sir William Stokes that the hip trouble was secondary to the trochanteric inflammation. He accordingly determined to tunnel the bone by means of a twist-gimlet and a conical-shaped scoop which was devised for him by Mr. Tenison Lyons of the Meath Hospital. On penetrating into the central portion of the trochanter an abscess was found, to the contents of which free exit was given. Some softened bone was then gouged out, and the tunnel having been thoroughly irrigated with a boric solution, one of Kocher's perforated glass tubes was inserted for purposes of drainage. This was removed on the third day after the operation. For a fortnight the tunnel was irrigated with

a warm boric solution. Throughout the convalescence of the patient the wound remained aseptic. The subsequent progress of the case was most satisfactory. The symptoms referable to the hip-joint subsided, and ultimately the patient returned home, quite free from pain and able to use the limb without inconvenience.

